AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior version, and listings, of claims in the application:

Listing of Claims:

Claims 1-15 (canceled).

16. (New) A magnetoresistive sensor element, comprising:

a magnetoresistive layer system that is at least regionally striated when viewed from the top and operates on the basis of the giant magneto resistance effect according to the spin valve principle, wherein the magnetoresistive layer system includes a reference layer having a direction of magnetization substantially uninfluenced by a direction of an external magnetic field acting on the reference layer;

wherein the magnetoresistive layer system provides a measuring signal that varies as a function of a measurement angle between a component of a field strength of the external magnetic field, said component lying in the plane of the layer system, and the direction of magnetization of the reference layer, and wherein the measurement angle is able to be ascertained from the measuring signal;

wherein, when viewed from the top of the magnetoresistive layer system, a first angle between the direction of magnetization of the reference layer in the absence of the external magnetic field and the longitudinal direction of the magnetoresistive layer system is set in such a way that, in response to an influence of the external magnetic field having a defined field strength that is selected from a predefined work interval, an angle error of the magnetoresistive layer system is substantially minimal, the angle error being defined as the maximum difference between: a) the angle between the component of the field strength of the external magnetic field lying in the plane of the magnetoresistive layer system and the direction of magnetization of the reference layer when a negligibly weak external magnetic field is present; and b) the measurement angle, ascertained from the measuring signal, between the component, lying in the plane of the layer system, of the field strength of the external magnetic field over all possible directions of the external magnetic field, and the direction of magnetization of the reference layer.

17. (New) The magnetoresistive sensor element according to Claim 16, wherein, when viewed from the top of the magnetoresistive layer system, the first angle between the direction of magnetization of the reference layer in the absence of the external magnetic field and the longitudinal direction of the magnetoresistive layer system, as well as the width of the magnetoresistive layer system, are adjusted so that the first angle and the width of the magnetoresistive layer system are matched to one another in such a way that, in response to an influence of the external magnetic field having a defined field strength that is selected from a predefined work interval, the angle error of the magnetoresistive layer system as a function of the first angle, the defined field strength of the external magnetic field and the width of the magnetoresistive layer system is substantially minimal.

18. (New) The magnetoresistive sensor element according to Claim 16, wherein the field strength of the external magnetic field is selected from a work interval of 0.8 kA/m to 80 kA/m, and wherein the angle between the direction of magnetization of the reference layer in the absence of the external magnetic field and the longitudinal direction of the magnetoresistive layer system is one of approximately 0°, 90°, 180°, and 270°.

19. (New) The magnetoresistive sensor element according to Claim 18, wherein the width of the magnetoresistive layer system is between 1 μm and 100 μm.

20. (New) The magnetoresistive sensor element according to Claim 16, wherein the magnetoresistive layer system includes an artificial anti-ferromagnet having a first fixed layer, a second fixed layer, and an intermediate layer positioned between the first fixed layer and the second fixed layer, wherein the first fixed layer is the reference layer.

21. (New) The magnetoresistive sensor element according to Claim 20, wherein the first fixed layer is made of a first ferromagnetic material, the second fixed layer is made of a second ferromagnetic material, and the intermediate layer is made of a non-magnetic material.

22. (New) The magnetoresistive sensor element according to Claim 21, wherein the thickness of the first fixed layer is approximately 0.2 nm to 0.8 nm less than the thickness of the second fixed layer.

23. (New) The magnetoresistive sensor element according to Claim 21, wherein the second fixed layer is positioned adjacent to an anti-ferromagnetic layer.

24. (New) The magnetoresistive sensor element according to Claim 21, wherein the first fixed layer is adjacent to a metallic layer including copper, and wherein the metallic layer is positioned adjacent to a detection layer that has a magnetization direction that is always at least approximately parallel to the direction of the component of the field strength of the external magnetic field, said component lying in the plane of the layer system.

25. (New) The magnetoresistive sensor element according to Claim 24, wherein the detection layer includes at least a first sublayer and a second sublayer, wherein the first sublayer includes CoFe alloy and is positioned adjacent to the metallic layer including copper, and wherein the second sublayer is made of a NiFe alloy.

26. (New) The magnetoresistive sensor element according to Claim 23, wherein the anti-ferromagnetic layer has a thickness of 20 nm to 40 nm, the second fixed layer has a thickness of 2 nm to 4 nm, the intermediate layer has a thickness of 0.6 nm to 0.8 nm, the first fixed layer has a thickness of 1 nm to 3.5 nm, the metallic layer has a thickness of 1 nm to 4 nm, the first sublayer has a thickness of 0.5 nm to 2 nm, and the second sublayer has a thickness of 1.5 nm to 5 nm.

27. (New) The magnetoresistive sensor element according to Claim 17, wherein when viewed from the top of the magnetoresistive layer system, the magnetoresistive layer system has a meander pattern including a plurality of first strip sections extending substantially in parallel, and wherein the directions of magnetization of the reference layers of the plurality of first strip sections being oriented substantially parallel to one another.

28. (New) The magnetoresistive sensor element according to Claim 27, wherein the magnetoresistive layer system includes second strip parts which extend at least regionally

perpendicular to the first strip sections, and wherein one of: a) the second strip parts are formed from a material exhibiting good electrical conductivity; and b) a conducting layer exhibiting good electrical conductivity is provided to extend in parallel to the second strip parts and electrically short-circuit the second strip parts.

29. (New) A method for minimizing an angle error of a magnetoresistive sensor element, comprising:

providing a magnetoresistive layer system that is at least regionally striated when viewed from the top and operates on the basis of the giant magneto resistance effect according to the spin valve principle, wherein the magnetoresistive layer system includes a reference layer having a direction of magnetization substantially uninfluenced by a direction of an external magnetic field acting on the reference layer, wherein the magnetoresistive layer system provides a measuring signal that varies as a function of a measurement angle between a component of a field strength of the external magnetic field, said component lying in the plane of the layer system, and the direction of magnetization of the reference layer, and wherein the measurement angle is able to be ascertained from the measuring signal; and

setting, when viewed from the top of the magnetoresistive layer system, a first angle between the direction of magnetization of the reference layer in the absence of the external magnetic field and the longitudinal direction of the magnetoresistive layer system in such a way that, in response to an influence of the external magnetic field having a defined field strength that is selected from a predefined work interval, the angle error of the magnetoresistive layer system is substantially minimal, the angle error being defined as the maximum difference between: a) the angle between the component of the field strength of the external magnetic field lying in the plane of the magnetoresistive layer system and the direction of magnetization of the reference layer when a negligibly weak external magnetic field is present; and b) the measurement angle, ascertained from the measuring signal, between the component, lying in the plane of the layer system, of the field strength of the external magnetic field over all possible directions of the external magnetic field, and the direction of magnetization of the reference layer.

30. (New) The method according to Claim 29, wherein, when viewed from the top of the magnetoresistive layer system, the first angle between the direction of magnetization of the

reference layer in the absence of the external magnetic field and the longitudinal direction of the magnetoresistive layer system, as well as the width of the magnetoresistive layer system, are adjusted so that the first angle and the width of the magnetoresistive layer system are matched to one another in such a way that, in response to an influence of the external magnetic field having a defined field strength that is selected from a predefined work interval, the angle error of the magnetoresistive layer system as a function of the first angle, the defined field strength of the external magnetic field and the width of the magnetoresistive layer system is substantially minimal.